

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Mark H. Naedler § Attorney Docket No.: NAED001/CON
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Serial No.: To Be Assigned § Anticipated Art Unit No.: 3617
 §
Filed: Herewith §
 §
For: *Vehicle Tire Inflation System* §

PRELIMINARY AMENDMENT

Box Patent Application
Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Kindly amend the above-identified application as follows:

In the Specification

On page 1, after the title, please delete the heading and paragraph at lines 1-3 and add the following new heading and paragraph:

CLEAN VERSION OF AMENDED SPECIFICATION

Cross-Reference to Related Applications

This application is a continuation of U.S. Application Serial No. 09/379,148, filed on August 21, 1999, which in turn claims the benefit of U.S. Provisional Application Serial No. 60/145,486, filed on July 16, 1999.

In the Claims

Please cancel claims 1-8.

Please add the following new claims, 9-30:

NEWLY ADDED CLAIMS

9. **(New)** In a tire inflation system for a vehicle having at least one axle with at least one pneumatic tire mounted on the end of the axle for rotation about the axle end and a source of pressurized air carried by the vehicle for supplying air to the interior of the axle and then to the hub to inflate the tire, the improvement comprising:

a first rotary union member mounted on the end of the axle and having a first elongate opening therethrough and with a first seal ring carried thereabout;

a second rotary union member mounted on the hub cap and having a second elongate opening therethrough in general alignment with the first opening and with a second seal ring carried thereabout; and

a flexible tube having

a first end extending into said first opening and sealably through said first seal ring;

a second end extending into said second opening and sealably through said second seal ring, whereby said tube may flex at each end adjacent said openings in the first and second members;

at least one of the seal rings being dynamic to accommodate rotation of the hub cap in relation to the axle;

each of said elongate openings closely receiving a substantial length of an end of said tube so that flexing of the tube compensates for misalignment while minimizing risk of distortion of said seal rings which might enable them to leak.

10. **(New)** As in claim 9, wherein

said first seal ring is dynamic.

11. **(New)** As in claim 9, wherein
said second seal ring is dynamic.
12. **(New)** As in claim 9, wherein
both of said seal rings are dynamic.
13. **(New)** As in claim 9, further including:
a bearing lubricant chamber within said hub cap,
a third seal ring carried about said second opening to sealably engage about said
tube inwardly of said second seal opening, and
a vent in said second member located between said second and said third seal
rings connecting said second member's elongated opening to the exterior of said hub cap.
14. **(New)** As in claim 9, wherein
said second member is mounted on said hub cap for removal from the outside
thereof.
15. **(New)** As in claim 9, wherein
said tube is made of fluorocarbon polymer.
16. **(New)** In a tire inflation system for a vehicle having at least one axle with at least
one pneumatic tire mounted for rotation about the end of the axle and a source of pressurized air
carried by said vehicle for supplying air to the interior of said axle and then to a hub cap to inflate
said tire, the improvement comprising:

a first rotary union member mounted on said axle's end having a first opening therethrough with a first seal ring carried thereabout generally in alignment with said axle's axis,

a second rotary union member mounted on the hub cap and having a second opening therethrough with a second seal ring carried thereabout in general alignment with said first opening, and

a tube with a flexible segment having

a first end extending into said first opening to sealably engage said first seal ring,

and

a second end extending into said second opening to sealably engage said second seal ring,

at least one of the seal rings surrounding one end of the the tube serves as a dynamic seal to accommodate rotation of said hub cap in relation to said axle, and

the opening adjacent to the one dynamic seal ring closely receives a sufficient length of said one end of the tube so that misalignment between said first and second members during rotation is compensated for by flexure in said flexible tube segment to minimize distortion of said dynamic seal.

17. **(New)** As in claim 16, wherein

the end of said one opening has a bell-mouth to receive said one end of the flexible tube during installation.

18. **(New)** As in claim 16, wherein

the other ring is static.

19. **(New)** As in claim 16, wherein

the other seal ring surrounds the second end of the tube to serve as a second dynamic seal during rotation of the hub cap in relation to the axle, and the opening adjacent to the other seal closely receives a sufficient length of the other end of the tube so that misalignment between said first and second members is compensated for by flexure in said tube to minimize distortion of said second dynamic seal.

20. **(New)** As in claim 16, wherein

a rigid sleeve surrounds a portion of the flexible tube so that said flexible tube cannot buckle if the distance between said first and second members is large.

21. **(New)** As in claim 16, further including:

a bearing lubricant chamber within said hub cap,

a third seal ring carried about said second opening to sealably engage about said tube inwardly of said second seal opening, and

a vent in said second member located between said second and said third seal rings connecting said member's elongate opening to the exterior of said hub cap.

22. **(New)** As in claim 16, wherein

said tube is a fluorocarbon polymer.

23. **(New)** As in claim 16, further including:

a bearing lubricant chamber within said hub cap,

a third seal ring carried about said second opening to sealably engage about said tube inwardly of said second seal opening, and

a vent in said second member located between said second and said third seal rings connecting said member's elongate opening to the exterior of said hub cap.

24. **(New)** As in claim 16, wherein
said tube is a fluorocarbon polymer.

25. **(New)** In a tire inflation system for a vehicle having at least one axle with at least one pneumatic tire mounted on the end of the axle for rotation about the axle end and a source of pressurized air carried by the vehicle for supplying air to the interior of the axle and then to a hub cap to inflate the tire, the improvement comprising:

a first rotary union member mounted on the end of the axle and having a first elongate opening therethrough and with a first seal ring carried thereabout;

a second rotary union member mounted on the hub cap and having a second elongate opening therethrough in general alignment with the first opening and with a second seal ring carried thereabout, and

a tube having a first end extending into and sealably through said first seal ring and a second end extending into and sealably through said second seal ring,

at least a portion of the tube intermediate the inner ends of the openings being flexible, whereby said tube may flex at each end adjacent said first and second openings; and

at least one of the seal rings serves as a dynamic seal during rotation of said hub cap in relation to said axle, and

the opening adjacent to the one dynamic seal ring closely receives a sufficient length of said one end of the tube so that misalignment between said first and second members to accommodate rotation is compensated for by flexure in said flexible tube to minimize distortion of said dynamic seal.

26. **(New)** As in claim 25, wherein,
said first seal ring is dynamic and said second seal ring is static.
27. **(New)** As in claim 25, wherein
said second seal ring is dynamic and said first seal ring is static.
28. **(New)** As in claim 25, wherein
said first and second seal rings are dynamic.
29. **(New)** As in claim 25, further including:
a bearing lubricant chamber within said hub cap,
a third seal ring carried about said second opening to sealably engage about said
tube inwardly of said second seal opening, and
a vent in said second member located between said second and said third seal
rings connecting said member's elongate opening to the exterior of said hub cap.
30. **(New)** As in claim 25, wherein
said tube is a fluorocarbon polymer.

Respectfully submitted,


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CERTIFICATE OF EXPRESS MAILING

I, Jan C. Lipscomb, hereby certify that this correspondence and all referenced enclosures are being deposited by me with the United States Postal Service as Express Mail with Receipt No. EL010849468US in an envelope addressed to Box Patent Application, Assistant Commissioner for Patents, Washington, DC 20231, on June 12, 2001.

By: Jan C. Lipscomb